



OLS-85 SmartClass™ Fiber

User's Guide

BN 2313/98.21

2014.01

FTTx/PON

English

Please direct all inquiries to your local JDSU sales company. The addresses can be found at:

<http://www.jdsu.com/Contact-Us>

A description of additional instrument features can be found at:

<http://www.jdsu.com/en-us/Test-and-Measurement/Pages/default.aspx>

Notice

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Notes:

Changes may be made to specifications, descriptions and delivery information.

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1 INTRODUCTION

OLS-85 Light Sources

The SmartClass™ Fiber OLS-85 light sources are professional, versatile, compact handheld instruments designed for qualification and certification of fiber optic networks. Thoroughly chosen combinations of available wavelengths make the SmartClass™ Fiber OLS-85 light sources the optimum choice for link loss testing and characterization of long-haul, metro, and access telecommunication networks, as well as for data center and local area network testing.

Single-Mode (SM) and Multi-Mode (MM) – The all-in-one solution

OLS-85 devices that have both single mode and multi-mode light sources are the most flexible test instruments. These instruments are particularly suitable for rental and measurement service companies.

Auto λ – Do it right the first time

OLS-85 Auto λ feature sends information about the emitted wavelengths to a receiving-end (e.g. OLP-85), enabling the receiving-end to automatically set up for correct wavelength setting and hence ensuring a correct measurement the first time.

Multi λ – Reduce testing time to a minimum

Combined with a compatible power meter (e.g. OLP-85) Multi- λ testing reduces testing time to a minimum by simultaneously testing at all wavelengths.

Macrobending test ready

Several OLS-85 variants provide a 1625 nm light source which is the ideal wavelength for detecting macrobending issues in fiber links.

Fiber inspection ready – Inspect before you connect

The SmartClass™ Fiber OLS-85 instruments are prepared for fiber inspection. Connection of a P5000i Digital Probe to the OLS-85 enables a technician to perform best practices fiber

inspection and automated Pass/Fail testing of optical connectors/adapters in order to ensure industry standard fiber endface quality and cleanliness.

You don't need an additional fiber microscope set – simply plug in a P5000i Digital Probe.

Report generation – Do it the easy way

Of course, it is possible to make measurement reports with a PC tool.

But it's even easier with SmartClass™ Fiber – generate your report on the instrument directly and you're done.

FTTx/PON aware

OLS-85 instruments allow for passive optical network (PON) testing at the ITU-T G.983.3, and IEEE 802.3ah specified wavelengths 1310 nm, 1490 nm, and 1550 nm. This is the ideal source for PON network loss testing.

Rugged and portable

Battery operation from AA dry batteries, or from a rechargeable Li-Ion Battery Pack ensure a long operating time in the field and a robust, shock-proof design makes the SmartClass™ Fiber instruments the perfect choice for optical network field testing, even under tough conditions.

Remote controllable

Operation from an AC/DC power supply and remote control capabilities via USB 2.0 and Ethernet make the SmartClass™ Fiber instruments even a perfect solution for fixed installations in central offices, in production environments, and on the laboratory workbench.

Differences between the instruments

	BN 2313/xy				
	01	05	06	22	26
<i>Wavelengths</i>					
850 nm	–	✓	–	–	–
1300 nm	–	✓	–	–	–
1310 nm	✓	✓	✓	✓	✓
1490 nm	–	–	✓	–	✓
1550 nm	✓	✓	✓	✓	✓
1625 nm	–	–	✓	✓	✓
<i>Optical outputs</i>					
Single-mode port	PC ¹⁾	PC	PC	APC ²⁾	APC
Multi-mode port	–	PC	–	–	–

1) physical contact

2) angled physical contact

Operating manual update

Continuing enhancement and further development of the SmartClass family may mean that this operating manual does not cover all the latest functions of your instrument.

If the operating instructions about features supported by your instrument are missing, please visit the JDSU web site to check if additional information is available.

To download the latest user manual:

1. Visit the JDSU web site at <http://updatemyunit.net>.
2. Select your SmartClass™ Fiber model from the product line.
3. Open the download area and download the latest user manual.

Symbols used in this operating manual

Various elements are used in this operating manual to draw attention to special meanings or important points in the text.

Symbols and terms used in warnings

The following warnings, symbols and terms are used in this document in compliance with the American National Standard ANSI Z535.6-2011:

NOTICE

Follow the instructions carefully to avoid **damage** to or **destruction** of the instrument.

⚠ CAUTION

Follow the instructions carefully to avoid a low or medium risk of **injury** to persons.

⚠ WARNING

Follow the instructions carefully to avoid **severe injury** to persons.

⚠ DANGER

Follow the instructions carefully to avoid **death** or **severe injury** to persons.



High voltage

Follow the instructions carefully to avoid **damage** to the instrument or **severe injury** to persons.

This safety instruction is given if the danger is due to **high voltage**.



Laser

Follow the instructions carefully to avoid **damage** to the instrument or **severe injury** to persons.

This safety instruction is given if the danger is due to **laser radiation**. Information specifying the laser class is also given.

Warning format

All warnings have the following format:

⚠ WARNING

Type and source of danger

Consequences of ignoring the warning.

► Action needed to avoid danger.

The following character formats are used in this operating manual:

✓	Requirement This requirement must be met first; e.g. ✓ The system is switched on.
▶ 1. 2.	Instruction Follow the instructions given (the numbers indicate the order in which the instructions should be followed); e.g. ▶ Select mode.
<i>Italics</i>	Result Indicates the result of following an instruction; e.g. <i>The page opens.</i>
Boldface	Pages, controls, and display elements Screen pages, controls, and display elements are indicated in boldface .
Text in blue	Cross references Cross references are indicated in blue type. When using the PDF version, just click on the blue text to skip to the cross reference.
[H]	Instrument keys Instrument keys are indicated within square brackets.
[More]	Touchscreen buttons Touchscreen buttons are indicated within blue square brackets.

2 SAFETY INFORMATION

Warning symbols on the unit



Warning symbols indicating a potential hazard

- ▶ In all cases where the unit is labeled with a warning symbol, the operating manual must be consulted to learn more about the nature of the potential hazard and any action that must be taken.
-

Proper usage

This instrument is intended for measurements on optical fiber devices and systems.

- ▶ Please make sure the instrument is not operated outside the permitted ambient conditions.
- ▶ Always make sure that the instrument is in proper working order before switching it on.

Laser safety



WARNING

Dangerous laser radiation

Laser radiation can cause irreparable damage to eyes and skin.

- ▶ This device is a Class 1 laser product according to DIN EN 60825-1:2007.
 - ▶ Always be aware of the hazard level of the instrument to be connected.
 - ▶ Connect all optical fibers before switching on the radiation source.
 - ▶ Switch off the laser source before disconnecting the optical fibers.
 - ▶ Never look directly into the unconnected port of the instrument, the output of a laser source, or an optical fiber connected to a source or a system.
 - ▶ Always cover unused ports.
 - ▶ Be aware that the emitted light is not visible.
 - ▶ Heed the normal precautions for working with laser radiation and consider local regulations.
-

Battery operation

WARNING

Explosion danger

Short-circuiting the batteries can result in overheating, explosion, or ignition of the batteries and their surroundings.

- ▶ Never short-circuit the battery contacts by touching both contacts simultaneously with an electrical conducting object.
 - ▶ Only use AA size dry batteries or rechargeable batteries.
 - ▶ Make sure the batteries are inserted with the correct polarity.
-

Ventilation

NOTICE

Insufficient ventilation

Insufficient ventilation can damage the instrument or adversely affect its function and safety.

- Ensure adequate ventilation when operating the instrument.
-

PS4 Universal AC/DC Power Supply

Safety class

The PS4 Universal AC/DC Power Supply unit has a protective isolation that conforms with IEC 60950.

Environmental conditions

NOTICE

Ambient temperature too high/low

Temperatures outside the operating range of 0 to +40 °C can damage the PS4 Universal AC/DC Power Supply or adversely affect its function and safety.

- Only operate the PS4 Universal AC/DC Power Supply indoors.
The PS4 Universal AC/DC Power Supply must only be operated at ambient temperatures between 0 and +40 °C.

NOTICE

Insufficient ventilation

Insufficient ventilation can damage the PS4 Universal AC/DC Power Supply or adversely affect its function and safety.

- Ensure adequate ventilation when operating the PS4 Universal AC/DC Power Supply.
-

NOTICE

Condensation

Operation in the presence of condensation can damage the PS4 Universal AC/DC Power Supply or adversely affect its function and safety.

- ▶ Do not operate the PS4 Universal AC/DC Power Supply if condensation has formed.
 - ▶ If condensation cannot be avoided, such as when the PS4 Universal AC/DC Power Supply is cold and is moved to a warm room, wait until the PS4 Universal AC/DC Power Supply Unit is dry before plugging it into the AC power line.
-

3 GETTING STARTED

Unpacking the instrument

Packing material

We suggest that you keep the original packing material. It is designed for reuse (unless it is damaged during shipping). Using the original packing material ensures that the instrument is properly protected during shipping.

Checking the package contents

- Unpack the instrument and check the package contents. For more information see “Included items” on page 89.

Checking for shipping damage

After you unpack the instrument, check to see if it was damaged during shipping. This is particularly likely if the packaging is visibly damaged. If there is damage, do not attempt to operate the instrument. Doing so can cause further damage. In case of damage, please contact your local JDSU sales company. Addresses can be found at www.jdsu.com.

Recovery following storage/shipping

Condensation can occur if a instrument that is stored or shipped at a low temperature is brought into a warm room. To prevent damage, wait until no more condensation is visible on the surface of the instrument before powering it up. Do not operate the instrument until it has reached its specified temperature range and wait until it has cooled down if the instrument was stored at a high temperature (see “General specifications” on page 87).

Instrument overview



Fig. 3.1 Front view OLS-85

1	Connector interface
2	Test head cover (green for APC- and gray for PC connectors)
3	3.5 inch touchscreen
4	Key pad (operator control panel)
5	Battery compartment and stand (on rear of instrument)
6	USB 2.0 device port (Type Micro-B)
7	USB 2.0 host port (Type A) and external power supply connector
8	Ethernet port (RJ-45)

Connector panel



Fig. 3.2 Connector panel of a single port instrument

1 Optical connector

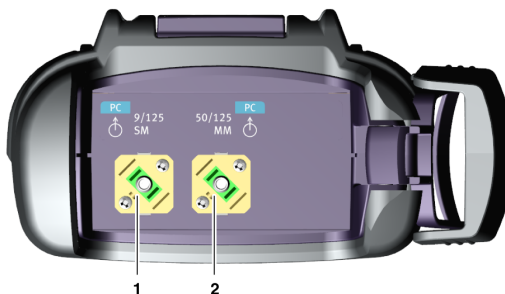


Fig. 3.3 Connector panel of a dual port instrument

1 Optical connector 1 for single mode

2 Optical connector 2 for multi mode

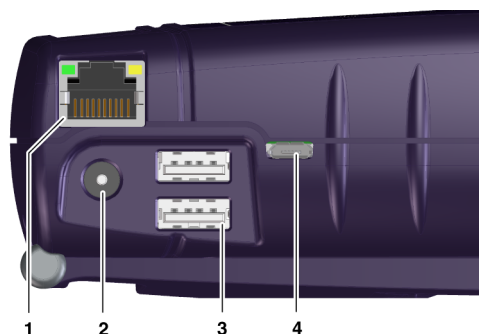


Fig. 3.4 External power supply connector and communication interfaces

- | | |
|---|------------------------------------|
| 1 | Ethernet port (RJ-45) |
| 2 | External power supply connector |
| 3 | USB 2.0 host port (Type A) |
| 4 | USB 2.0 device port (Type Micro-B) |

Power supply

The following power sources can be used to operate the OLS-85:

- Eight 1.5 V dry batteries
(Mignon AA size, alkaline type recommended)
- Eight 1.2 V NiMH rechargeable batteries
(Mignon AA size, no internal charge)
- PS4 Universal AC/DC Power Supply (optional)
- RBP2 Li-Ion Battery Pack (optional)

Battery operation

⚠ WARNING

Dangers when handling batteries

Handling batteries may be dangerous. Please note the following safety instructions.

Please note the battery operation safety information in the chapter [“Battery operation” on page 8](#).

Replacing batteries

- ▶ Do not replace individual batteries. Always change all eight batteries at the same time.
- ▶ Always use eight batteries of the same type; i.e. do not mix rechargeable and non-rechargeable batteries.

Replacing batteries

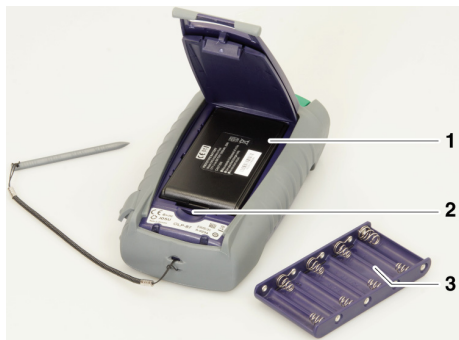


Fig. 3.5 Replacing the batteries

- | | |
|---|--------------------------|
| 1 | RBP2 Li-Ion Battery Pack |
| 2 | Latch lock |
| 3 | AA battery tray |

The battery compartment is on the back of the instrument.

1. Press down the latch to release and to open the lid of the battery compartment.
2. Insert new batteries or remove the used batteries and replace them with fresh ones.

NOTICE: Take care to insert the batteries correctly. The correct polarity is indicated by a diagram inside the battery compartment.

– or –

1. Press down the latch lock to release the battery tray.
2. Insert the RBP2 Li-Ion Battery Pack.
3. Close the battery compartment.
4. Press the [O] key to switch on.

Recharging the batteries

The rechargeable RBP2 Li-Ion Battery Pack is recharged when the PS4 Universal AC/DC Power Supply is being used to power the instrument. The instrument switches to trickle charging automatically as soon as the RBP2 Li-Ion Battery Pack is fully charged.

Notes: Rechargeable AA batteries will not be recharged in the instrument. For AA-type rechargeable batteries please use an external charger.
It is not possible to charge the rechargeable AA batteries or the RBP2 Li-Ion Battery Pack via the USB interface.

The instrument is powered by the PS4 Universal AC/DC Power Supply if the PS4 Universal AC/DC Power Supply and the USB interface are both connected.

General tips on using batteries

- Always handle batteries with care.
- Do not drop or damage the batteries or expose them to excessively high temperatures.
- Do not store the batteries for more than one or two days at very high temperatures (e.g. in a vehicle), either separately or inserted in the instrument.
- Do not leave discharged batteries in the instrument for a long time if it is not being used.

Other basic safety precautions are as follows:

- Do not use PS4 Universal AC/DC Power Supply outdoors or in wet or damp locations.
- Connect the PS4 Universal AC/DC Power Supply to the correct mains voltage, as indicated on the rating label.
- Do not allow anything to rest on the power cord, and do not place the product where people can walk on the power cord.
- Avoid using this product during electrical storms. There may be a remote risk of electric shock from lightning.
- Do not use this product in the vicinity of a gas leak or in any explosive environment.

- Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous, high voltage points, and other hazards. Contact qualified service personnel for all service.

Environmental protection

Please dispose of any unwanted dry batteries and rechargeable batteries carefully. They should also be removed from the instrument if it is to be discarded. If facilities in your country exist for collecting such waste or for recycling, please make use of these rather than throwing the batteries in with normal trash. You will often be able to return used batteries to the place where you purchase new ones. Any dry or rechargeable batteries that you purchased from JDSU can be returned to one of our Service Centers for disposal.

Operation from AC power

NOTICE: Only the PS4 Universal AC/DC Power Supply may be used to operate the OLS-85 from AC power.

To fit the AC line plug adapter:

1. Select the appropriate AC line plug adapter.
2. Slide the AC line plug adapter into the slot.

The PS4 Universal AC/DC Power Supply is ready for use.

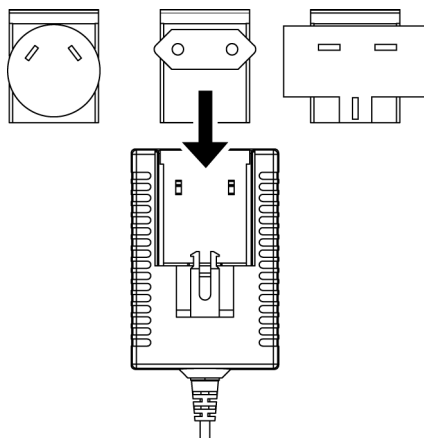


Fig. 3.6 PS4 Universal AC/DC Power Supply

To change the AC line plug adapter:

1. Squeeze both sides of the PS4 latch lock (see Fig. 3.6).
2. Push the AC line plug adapter upwards.
3. Slide a different AC line plug adapter into the slot (see Fig. 3.7).

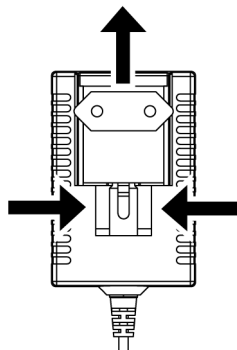


Fig. 3.7 PS4: Changing the AC line plug adapter

To operate the OLS-85 from AC power:

1. Connect the PS4 DC power cord to the OLS-85 external power supply connector.
(The connector is under the cover on the right side.)
2. Plug the PS4 into the AC line socket.
The OLS-85 switches on automatically when powered from the PS4.

Notes: The PS4 provides power even if dry or rechargeable batteries are inserted in the instrument.
The OLS-85 cannot be powered via the USB interface.

Connecting optical cables

Mounting test adapters

JDSU provides a number of test adapters for connecting the OLS-85 to the interface to be tested.

You can connect all standard optical connector types to the instrument using these adapters. The test adapters are suitable for connectors with planar (PC) and angled end surfaces (APC). Contact your local JDSU sales company for available adapter types.

The OLS-85 connector type must match the cable connector type:

- PC: BN 2305/01/11
- APC: BN 2305/21/26/31/36/66

The PC/APC versions are easily identified by the colors of the name labels on the front:

- PC = blue
- APC = green

Notes: Only single mode fibers (SMF) may be connected to the OLS-85.

To mount the JAE test adapter:

- ✓ The optical connectors are properly cleaned (see [“Cleaning the test port” on page 53](#)).
1. Open the head cover and remove the protective cap (if still mounted).
 2. Place the test adapter vertically on the optical connector with the locking lever open.
 3. Close the locking lever once the test adapter is firmly seated. You will hear the locking mechanism click.
 4. Repeat the procedure if the instrument is equipped with two ports.
 5. Fit the fiber optic cable to the test adapter or close the head cover.

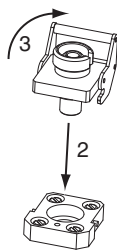


Fig. 3.8 Mounting the JAE test adapter

To mount the SENKO test adapter:

1. Open the head cover and remove the protective cap (if still mounted).
2. Unscrew the SENKO test adapter and pull it off vertically.
3. Place the SENKO test adapter vertically on the optical connector.
4. Fix the SENKO test adapter with two screws.
5. Repeat the procedure if the instrument is equipped with two ports.

6. Fit the fiber optic cable to the test adapter or close the head cover.



Fig. 3.9 Mounting the SENKO test adapter

4 BASIC OPERATION

Switching the instrument on/off











To switch the instrument on:

- ▶ Press the [o] key to switch on the instrument.

To switch the instrument off:

- ▶ Press the [o] key to shift the instrument in hibernate mode.
– or –
- 1. Hold the [o] key to open the power off menu.
- 2. Tap the [Power Off] button to switch off the instrument.








Operator control panel

	Press to go to the homescreen.
	Press to open menu.
	Press to go back within an application or cancel input.
	Press to toggle between the inspect view and the test view.
	Press to switch the instrument on and off. LED glows green when the instrument is on.
	Press an arrow key to: <ul style="list-style-type: none"> • Navigate through the menus • Change values in the menus Press the centered key to: <ul style="list-style-type: none"> • Confirm the selection
	Press to save results.
	Glows red when battery is low.
	Glows red when a measurement is running in the background.
	Glows orange when battery is charged; flashes orange when battery is charging. Turned off when dry batteries are used or battery bay is empty.

Display elements



Fig. 4.1 Homescreen

	Link Data Mode Indicates that the project data is summarized.
	Auto-Off Indicates whether the instrument turns off within a certain time.
	External power supply The OLS-85 is powered by the external AC adapter when this symbol is shown.
	Battery status Indicates the battery charge status. If it is not shown, only the AC adapter is active.
	Laser To edit the laser for maintenance and characterization of single-mode and multi-mode networks.
 	Probe To view and inspect both the bulkhead (female) and patch cord (male) sides of fiber connectors, as well as other optical devices, such as transceivers.

Navigating in the menus

- ▶ Press the [≡] key to open the context-sensitive menu.
Depending on which application is in the foreground, a different menu opens.

To select a menu item:

1. Press the arrow keys to highlight an item.
2. To confirm, press the center key within the arrow keys.
– or –
Tap the desired button on the touchscreen.

To leave a menu without making any changes:

- ▶ Press the [↶] key.

Notes: All actions can be operated via the operator control panel or the touchscreen. The following instructions describe only touchscreen operation.

To toggle between different display modes:

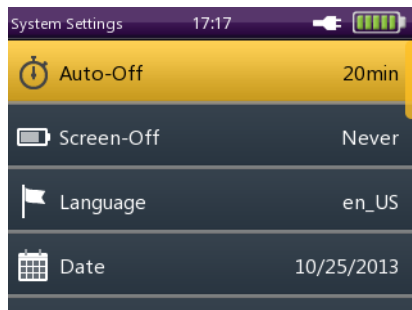
- ▶ Tap on the display to toggle between the display modes (context-sensitive).

Configuring the instrument

This chapter describes the configuration of the **System Settings**.

System Settings menu overview

- ✓ The homescreen is displayed.
- ▶ Press the [≡] key and tap the [Settings] button.
*The **System Settings** menu opens:*



The following table gives a short overview of the menu items. These are explained in the sections below.

Auto-Off	To adjust the switch-off period of the instrument.
Screen-Off	To adjust the switch-off period of the screen.
Language	To select the language of the instrument texts.
Date & Time	To adjust the date, date format, time, and to set 24-hour time or 12-hour time.
Date	To adjust the date.
Date Format	To adjust the date format.
Time	To adjust the time.
Time Format	To set 24-hour time or 12-hour time.
Network	To set the communications protocols.
IP Mode	To select either static or DHCP Ethernet mode.
IP Address	To set the IP-address in static Ethernet mode.
Gateway	To set the Gateway in static Ethernet mode.
Netmask	To set the Netmask in static Ethernet mode.
MAC Address	Unique identifier assigned to network interfaces for communication on the physical network segment.
Remote Control Port	Shows the TCP port used for remote control via Ethernet.
Measurement Data	To manage projects.
Create Project	To create a new project group.
Delete Project	To delete the project currently displayed.
Link Data Mode	To summarize data for a project.
Factory Reset	Set the instrument parameters and settings to their default values as defined by JDSU. This does not affect any stored measurement results.
Manual	To show reference information and user assistance for the instrument.
Info	To show information about calibration, software, and hardware.

Changing the Auto-Off setting

- ✓ The instrument is switched on.
- 1. Press the [≡] key and tap the [Settings] button.
- 2. Tap the [Auto-Off] button.
The power mode menu opens.
- 3. Select the desired setting to change the power mode.

Changing the Screen-Off setting

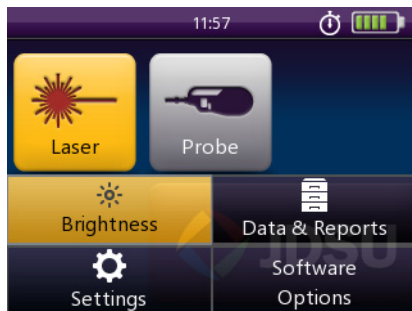
1. Press the [≡] key and tap the [Settings] button.
2. Tap the [Screen-Off] button.
3. Select the desired setting to change the screen off time.

Notes: **Auto-Off** and **Screen-Off** settings are only active when no external power supply is connected.

Adjusting the display brightness

1. Press the [≡] key.

The menu opens:



2. Tap the [Brightness] button.
3. Type in the desired brightness value.
4. Tap the [OK] button.

Selecting a language

1. Press the [≡] key and tap the [Settings] button.
2. Tap the [Language] button.

The language menu opens:



3. Tap the language you want to select.
– or –

Press the arrow keys to highlight the language you want to select and to confirm press the center key within the arrow keys.

Setting the date

1. Press the [≡] key and tap the [Settings] button.
2. Tap the [Date & Time] button.
3. Tap the [Date] button.
4. To change the setting, tap on the [Day], [Month], or [Year] button.
5. Type in the desired value and tap the [OK] button.
6. Tap the [OK] button again.

Setting the date format

1. Press the [≡] key and tap the [Settings] button.
2. Tap the [Date & Time] button.
3. Tap the [Date Format] button.
4. To change the setting, tap on the desired date format.

Setting the time

1. Press the [≡] key and tap the [Settings] button.
2. Tap the [Date & Time] button.
3. Tap the [Date] button.
4. To change the setting, tap on the [Hour], [Minute], or [Second] button.
5. Type in the desired value and tap the [OK] button.
6. Tap the [OK] button again.

Setting the 24-hour or 12-hour time

1. Press the [≡] key and tap the [Settings] button.
2. Tap the [Date & Time] button.
3. To change the setting tap the [Time] button.

Selecting the IP Mode

1. Press the [≡] key and tap the [Settings] button.
2. Tap the [IP Mode] button.
3. Tap the Ethernet Mode you want to select.

Resetting to the factory default values

1. Press the [≡] key and tap the [Settings] button.
2. Tap the [Factory Reset] button.

Notes: Setting the factory default values does not affect your stored measurement results.

Updating the firmware

The latest version of the firmware can be downloaded from the Internet.

To find the latest firmware version:

1. Visit the JDSU web site at <http://updatemyunit.net>.
2. Select your model from the product line.
3. Open the download area and download the latest firmware.
4. Unzip and save the firmware to the root of a USB flash drive.

To update the downloaded firmware:

- ✓ The instrument is fully charged or the PS4 Universal AC/DC Power Supply is connected.
 - ✓ The instrument is switched off and not in hibernate mode.
1. Press and hold down the [≡] key.
 2. Press the [○] key to switch the instrument on.
The firmware update screen appears.
 3. Release the [≡] key.
 4. Plug the USB flash drive into one of the instrument USB ports.
 5. To start the firmware update procedure, press the center key within the arrow keys.
If the update procedure is terminated the instrument turns off automatically.
 6. Remove the USB flash drive.
 7. Press the [○] key to switch the instrument on.

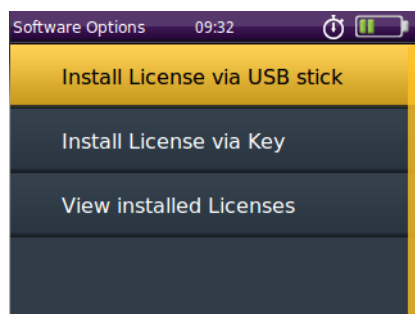
Resetting the instrument

- To reset the instrument, press the [○] key for more than 10 seconds.
Date and time are reset and the stored measurement data remains.

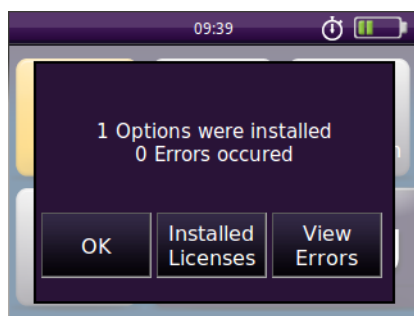
Software options

To install new software options:

1. Contact your local JDSU sales company or visit the JDSU web site at www.jdsu.com.
2. Select a software option from the product line and order it just like an instrument.
An e-mail with the license key will be sent.
3. Save the software option to the root of a USB flash drive.
4. Plug the USB flash drive into one of the instrument USB ports.
5. Press the [≡] key and tap the [Software Options] button.
The menu opens:



6. To start the installation, tap the [Install license via USB stick] button.
– or –
To type the license key, tap the [Install license via key] button.
Successful installation or number of errors will be displayed in the following menu:



7. Remove the USB flash drive.

To display the installed software options:

- ✓ The software options are installed and the confirmation menu is displayed.
- ▶ To show the installed software options, tap the [Installed Licenses] button.
– or –
- ✓ The homescreen is displayed.
 1. Press the [≡] key and tap the [Software Options] button.
 2. To show the installed software options, tap the [View installed licenses] button.

5 PROBE/PCM OPERATION

General information

Dirty and/or damaged connectors are often the root cause of optical network problems. The Probe and PCM applications enable industry standard inspection and automated Pass/Fail testing with report generation of optical connectors/adapters in order to ensure industry standard fiber endface quality and cleanliness.

For best workflow efficiency, there are two variants of fiber microscopes available in the SmartClass™ Fiber family. The integrated Patch Cord Microscope (PCM) which is best suited for inspecting fiber endfaces of patch cords and the external P5000i Digital Probe (see [“Digital Probe” on page 89](#)) which may be either used for bulkhead inspection or patch cord inspection.

The shortest inspection time is achieved when using one of the OLP-87P models with an integrated PCM for patch cord inspection and a P5000i Digital Probe for bulkhead inspection.

Both applications – Probe and PCM – behave essentially the same and are described together below.

Notes: Only if a P5000i Digital Probe is connected to the instrument is the Probe application fully functional. Select an OLP-87P version in order to get PCM functionality.

Patch Cord Microscope (PCM)

The PCM is a microscope used to view and inspect patch cord (male) sides of fiber connectors.

In order to support a wide variety of fiber optic connectors the PCM provides an exchangeable FMAE adapter. The dedicated QuickCapture key provides either instant triggering of a Pass/Fail test or freezing the live image. For best workflow adaption the key action is configurable. The dedicated Magnification Control key provides fast toggling between two microscope magnification levels, low magnification for high level inspection of the fiber endface, and high magnification for detailed inspection of the fiber endface.



Fig. 5.1 Patch cord microscope components

1	FMAE adapter
2	QuickCapture™ key
3	Focus Control
4	Magnification Control key

FMAE series adapters for the PCM

SmartClass™ Fiber devices with the PCM use FMAE series adapters to ensure consistent and accurate inspection for a wide variety connectors and applications. All PCM configurations ship with an included 2.5 mm interface. Kitted configurations may include additional FMAE adapters.

Features available with the P5000i Digital Probe

The P5000i Digital Probe is a portable handheld microscope used to view and inspect both the bulkhead (female) and patch cord (male) sides of fiber connectors, as well as other optical devices, such as transceivers.

The Digital Probe is specially designed to fit and operate comfortably and easily in-hand, allowing the user to inspect hard-to-reach connectors that are installed on the back side of patch panels or inside hardware devices. In order to support a wide variety of fiber optic connectors the P5000i provides an exchangeable FBPT inspection tip. The dedicated QuickCapture key provides either instant triggering of a pass/fail test or of freezing the live image. For best workflow adaption the key action is configurable. The dedicated Magnification Control key

provides fast toggling between two microscope magnification levels - low magnification for high level inspection of the fiber endface and high magnification for detailed inspection of the fiber endface.

The P5000i Digital Probe kit sold with the OLS-85 contains the standard barrel assembly (FBPP-BAP1), standard patch cord tips, and standard bulkhead tips.



Fig. 5.2 P5000i Digital Probe components

1	Inspection tip
2	Barrel assembly
3	QuickCapture™ key
4	Focus Control
5	Magnification Control key
6	USB 2.0 connector
7	1.83 m (6 ft) coil cable

FBPT series tips for the P5000i

The P5000i Digital Probe uses FBPT series inspection tips to ensure consistent and accurate inspection for a wide variety of connectors and applications. These connector-specific and universal inspection tips are interchangeable, which allows the P5000i Digital Probe to interface with different types of fiber connectors.

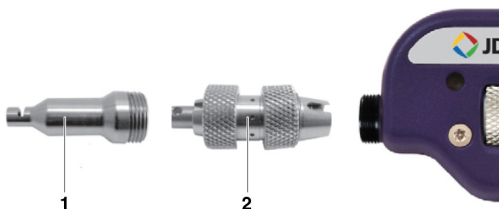


Fig. 5.3 FBPT series tips for the P5000i

1	Inspection tip
2	Barrel assembly

P5000i connection

The Probe application requires a P5000i Digital Probe in order to be fully functional (see the list of all accessories in “[Digital Probe](#)” on page 89).

1. Plug your P5000i into an USB port.
2. Connect the P5000i with the fiber being inspected.
3. Press the **[▲]** key, then tap the **[Probe]** button or use the arrows keys.

– or –

Press the **[⇐]** key, to toggle between the measurement view and the inspection view.

The P5000i will display the live view.

QuickCapture™ key

In order to support different workflows the functionality of the QuickCapture™ key is configurable. Pressing the key will either freeze the live image or start a test:

Test	Pressing the key will automatically freeze the live image and perform a test.
Freeze	Pressing the key will automatically freeze the live image.

Camera mode

Set the QuickCapture™ key on the Digital Probe to get a live picture of the result.

Tip: Use the Focus Control key to adjust the focus of the image.

✓ The Digital Probe is connected to the instrument.

⇒ To display the live view, tap the **[Probe]** button.

File toolbar

Saving a picture

It is possible to save the frozen picture from the Digital Probe.

1. Press the **[F]** key.
2. Edit the file name.
3. Tap the **[OK]** button.

File is saved in the preselected group.

Configuring the Digital Probe

1. Tap the [Probe] button.
2. Press the [≡] key to configure the Digital Probe according to the following description.

Brightness settings

1. Set the luminosity manually using the arrow keys.
– or –
Tap the key [≡] > [Brightness] to tune the luminosity to the desired value.
2. Tap the [OK] button.
– or –
To confirm, press the center key within the arrow keys.

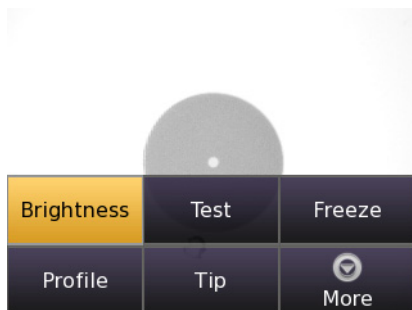
Test mode

Launching a test of the connector and fiber end-face

See “Freeze mode” on page 37 for more information on commands available.

To launch the test with the predefined profile (see “Profile” on page 38):

1. With the P5000i Digital Probe, use the Focus Control key (see Fig. 5.2) to adjust the image quality and sharpness.
2. Press the [≡] key and tap the [Test] button.



– or –

Press the QuickCapture™ key on the Digital Probe if the button action is set to **Test**.

When the test procedure terminates, the information shown on the display depends on the current overlay setting:

- ⇒ Press the [≡] key, and then the [Overlay] button to change the overlay view. Repeat the action until the desired view appears.

Three views can be displayed: without overlay, with colored edges, and colored edges with a legend.

Overlay

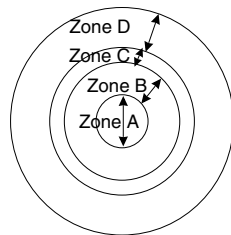
A summary of test results is displayed at the upper right of the screen.

Zone A: represents the core zone: it is the area surrounding the core

Zone B: represents the cladding zone. It surrounds the majority of the fiber cladding.

Zone C: represents the epoxy ring.

Zone D: represents the ferrule zone: it identifies a portion of the ferrule near and around the fiber.



Notes: To return to a Live image, press the QuickCapture™ key or press the [≡] key and tap the [Live] button to view both the live image and a test result simultaneously. If the test has been passed, the image has a green colored frame. If failed, the frame is red.

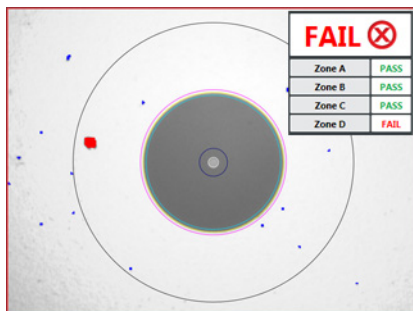


Fig. 5.4 Pass/Fail analysis – overlay view

Magnification Control

The Magnification Control allows you to modify the live display from high to low magnification and vice-versa. In the high magnification mode an automatic centering is available.

Picture selected: Live

- | | |
|--------|--|
| Test | Allows you to launch a (new) test of the connector (see “Launching a test of the connector and fiber end-face” on page 35) |
| Freeze | Allows you to freeze the live image and to save it later on the disk. Once this key is pressed, the freeze image is automatically set to position 2. |

Picture selected: Test

Save allows you to save the selected picture in the current selected group in the disk of the instrument. Press the **[F]** key, enter a name for the JPG file, and validate.

Overlay allows you to display or hide the limits of each zone and the defaults on image from a test result.

Magnification Control allows you to switch all the images from Digital Probe test results from high to low magnification and vice-versa.

Saving the test result in a JPG file

Once the test has been performed and the result is displayed on the OLS-85 screen:

1. Click on the **[F]** key to save a JPG file of the test result in the currently active group on the OLS-85.
2. On the edition keypad, enter the name of the JPG file.
3. Press Enter to validate and save the document.

The file is saved in the current active group directory on the OLS-85.

Freeze mode

Once the image is acceptable (sharpness, luminosity are tuned correctly), you may freeze the picture. This feature allows you to store the resulting picture in order to compare it later to others or save it in a file. In Freeze Mode the picture has a blue colored frame.

Tip: Freezing a result does not store the picture in a file (see [“Saving a picture” on page 34](#)). The result will be lost if the instrument is shut off.

Depending on the QuickCapture™ key setting, this key allows you to freeze the picture or to start a test.

Profile

1. Press the [≡] key.
2. Tap the [Profile] button.
3. Tap the Profile which will be used for the test of the fiber connector:
 - E2000: Pass/Fail criteria for precision metal ferrule connectors.
 - Ribbon_: Pass/Fail criteria for single-mode and multi-mode connectors from IEC 61300-3-35 standard.
 - SM-UPC: Pass/Fail criteria for single-mode UPC connectors from IEC 61300-3-35 standard.
 - SM-APC: Pass/Fail criteria for single-mode APC connectors from IEC 61300-3-35 standard.
 - SM_PC: Pass/Fail criteria for single-mode PC connectors from IEC 61300-3-35 standard.
 - MM_: Pass/Fail criteria for multi-mode connectors from IEC 61300-3-35 standard.
 - SFP_: Pass/Fail criteria for small form-factor pluggables.

Profiles contain the analysis parameters from which Pass/Fail criteria are determined.

Tip

1. Press the [≡] key.
2. Tap the [Tip] button.
3. Select the tip set on the Digital Probe to connect fiber for inspection and tap on the tip set.

More

1. Press the [≡] key.
2. Tap the [More] button to view or change the storage location, settings and information of the Digital Probe.

6 LASER OPERATION



⚠ WARNING

Dangerous laser radiation

Laser radiation can cause irreparable damage to eyes and skin.

- ▶ This device is a Class 1 laser product according to DIN EN 60825-1:2007.
- ▶ Always be aware of the hazard level of the instrument to be connected.
- ▶ Connect all optical fibers before switching on the radiation source.
- ▶ Switch off the laser source before disconnecting the optical fibers.
- ▶ Never look directly into the unconnected port of the instrument, the output of a laser source, or an optical fiber connected to it.
- ▶ Always cover unused ports.
- ▶ Heed the normal precautions for working with laser radiation and consider local regulations.

General information

Various fiber optic tests (e.g. loss test, fiber identification) require a reliable and stable optical source. OLS-85 devices are high-quality optical sources, which in addition to a stable optical signal have other useful properties, which simplify and shorten the work processes and exclude potential sources of error in measurement setups.

OLS-85 devices include several light sources – i.e. lasers and/or LEDs – which are stabilized using an automatic gain control mechanism. LEDs are typically used for multi-mode fiber measurements. On the other hand, lasers are used for single-mode fiber measurements.

Notes: In this manual, the word laser is used synonymously for laser and LED sources.

The output signals of the light sources may be either continuous wave (CW) or modulated at certain frequencies, i.e. 270 Hz, 1 kHz, or 2 kHz. JDSU power meters (e.g. OLP-3x, OLP-8x) are capable of detecting these modulation frequencies. This method

improves ambient light rejection in certain measurement setups. Additionally, the modulated signals can be used for fiber identification or for confirmation of continuity.




OLS-85 instruments provide the Auto λ feature. When activated, the OLS-85 embeds wavelength ID information into the emitted signal(s). This wavelength ID information can be utilized by a compatible JDSU power meter (e.g. OLP-85) for automatic wavelength setup and for simultaneous reception of multiple wavelengths. This minimizes test time and prevents common errors such as incorrect wavelength setting at the optical power meter.

Furthermore all OLS-85 instruments provide Auto- λ -Multi and Auto- λ -Serial modes which significantly reduce test time compared to manually switching wavelengths.

Display elements



Fig. 6.1 Laser application

	Laser On/Off Turn the laser on or off.
	Mode selection Switch between the modes CW, 270 Hz, 1 kHz, 2 kHz, and Auto λ .
	Wavelength selection Select the required wavelengths.

Selecting a laser source

To select a wavelength from the laser source menu

- ✓ The instrument is in **Laser** mode.
- ▶ Tap on one or multiple wavelengths in order to select them.
If the checkmark is shown, the dedicated wavelength is selected.
– or –
- 1. Press the [≡] key.
- 2. Tap the [Select Laser] button.
Select laser source menu is displayed.
- 3. Tap on one or multiple lasers to select them.
If the checkmark is shown, the dedicated wavelength is selected.
- 4. Press the [↩] key.
- 5. To turn on the selected lasers, tap the [Laser On/Off] field or press the center key within the arrow keys.

Notes: If more than one laser is selected, only “Auto λ ” mode can be activated!

Auto λ feature

When in one of the Auto λ modes, the OLS-85 embeds wavelength ID information into the emitted signal(s). This wavelength ID information can be utilized by a compatible JDSU power meter (e.g. OLP-85) for automatic wavelength setup and for simultaneous reception of multiple wavelengths.

Auto- λ -Multi mode is a proprietary JDSU solution that reduces the testing time to a minimum by simultaneously testing at all wavelengths (see Fig. 6.2). Combined with a compatible power meter (e.g. OLP-85) the power meter automatically sets itself up for Multi λ test.

Auto- λ -Multi should be selected every time the optical power meter supports the Auto- λ -Multi feature.

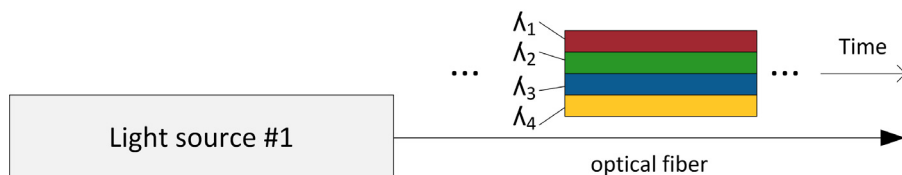


Fig. 6.2 Auto- λ -Multi

Auto- λ -Serial automatically toggles between all selected wavelengths (see Fig. 6.3), and combined with a compatible power meter (e.g. OLP-3x, OLP-85) the power meter automatically sets up with correct wavelength settings. This mode should be selected when low levels are expected on the optical power meter or when the power meter doesn't support Auto- λ -Multi.

Auto- λ -Serial should only be used in special cases, for instance when there is very low optical level on the optical power meter or when the optical power meter only supports Auto- λ -Serial.

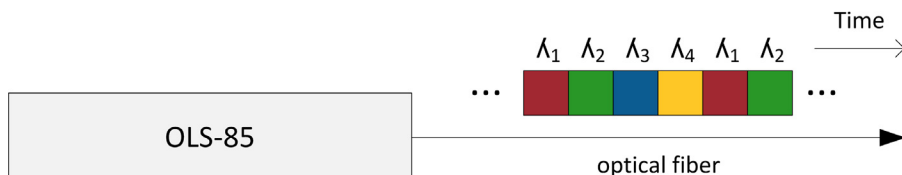


Fig. 6.3 Auto- λ -Serial

Notes: Wavelengths cannot be reliably detected by a power meter,

- if the receive level is too low,
- the wavelength encoding cannot be detected due to interference,
- or if you are measuring the absolute level of a system that does not have wavelength encoding matching JDSU power sources.

Selecting a mode

Tapping on the [Mode selection] field (see Fig. 6.1) toggles between the modes as shown in the figure below. There are modes where only a single wavelength can be selected (i.e. CW, 270 Hz, 1 kHz, 2 kHz). Furthermore there are Auto λ modes where multiple wavelengths can be selected (i.e. Auto λ , Auto- λ -Multi, Auto- λ -Serial). When there is only a single wavelength selected, the device is in Auto λ mode. When there are multiple wavelengths selected one can toggle between Auto- λ -Multi and Auto- λ -Serial mode.

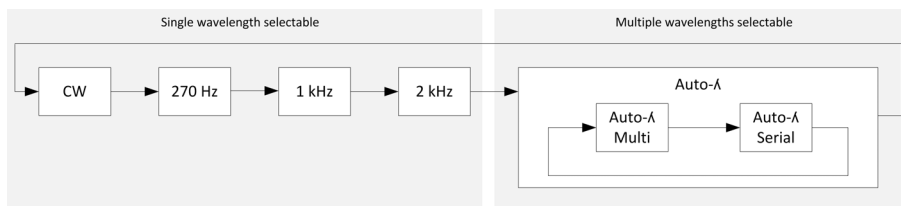
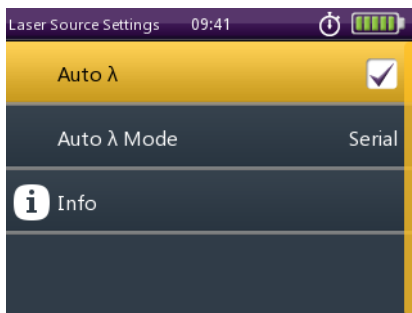


Fig. 6.4 Mode selection

Enabling Auto λ mode

To switch Auto λ mode on:

- ✓ The instrument is in **Laser** mode.
 - Tap the [Mode selection] field until Auto λ mode is shown.
 - or –
 - 1. Press the [≡] key.
 - 2. Tap the [More] button.
- The menu opens:*



- 3. Tap the [Auto λ] button to set or remove the checkmark.
- The Auto λ mode is on/off.*

Notes: Signal modulation (270 Hz, 1 kHz, 2 kHz) cannot be selected when Auto λ is enabled.

To select the Auto- λ -Multi or Serial mode:

If multiple lasers are selected, you have the choice of Multi or Serial mode:

- Multi: All selected lasers emit simultaneously.
 - Serial: The selected lasers emit successively.
- To toggle between Multi and Serial mode, tap the [Mode selection] field on the upper right side of the touchscreen.
- or –
1. Press the [≡] key.
 2. Tap the [More] button.
 3. Tap the [Auto λ Mode] button.
 4. Tap the desired **Auto λ Mode**.

Enabling tone modulation

To enabling tone modulation:

- Tap the [Mode selection] field on the upper right side of the touchscreen until the desired modulation frequency is displayed.
- or –
1. Press the [≡] key.
 2. Tap the [Modulation] button.
 3. Tap on the desired laser modulation.
CW – Continuous Wave, 270 Hz, 1 kHz or 2 kHz is marked.

Notes: A modulation frequency of 270 Hz, 1 kHz or 2 kHz can be set only if one single laser is selected and Auto λ is turned off.

Setting the power level

The power level can be set for each wavelength separately and will be stored permanently.

Changing the power level

- ✓ The instrument is in **Laser** mode.
1. Press the [≡] key.
 2. Tap the [Adjust Level] button.
 3. Tap on the desired wavelength.
The display changes to edit mode.

4. Press the arrow keys to increase or decrease the power level.
Press once to change the level in 0.01 dBm steps.
– or –
Hold down the key to accelerate the step rate.
5. Press the [↩] key.

Switching on/off the laser



⚠ WARNING

Dangerous laser radiation

Laser radiation can cause irreparable damage to eyes and skin.

- ▶ This device is a Class 1 laser product according to DIN EN 60825-1:2007.
- ▶ Always be aware of the hazard level of the instrument to be connected.
- ▶ Connect all optical fibers before switching on the radiation source.
- ▶ Switch off the laser source before disconnecting the optical fibers.
- ▶ Never look directly into the unconnected port of the instrument, the output of a laser source, or an optical fiber connected to it.
- ▶ Always cover unused ports.
- ▶ Heed the normal precautions for working with laser radiation and consider local regulations.

- ✓ The instrument is in **Laser** mode.
- ▶ To switch on the laser, tap the [Laser On/Off] field.
– or –
- ▶ Press the center key within the arrow keys.
– or –
- 1. Press the [≡] key.
- 2. Tap the [Laser on] button.
- ▶ To switch off the laser, repeat one of the above mentioned actions.

7 MEMORY MANAGEMENT


General information

The OLS-85 allows you to save measured values and inspection images in a structured data memory and recall them as required.

Data can also be downloaded via the USB interface to a PC for further evaluation.

Data & Reports controls

✓ The instrument is in the **Data & Reports** view.

1. Select an application.
2. Press the  key to open the **Data & Reports** menu.

The following table gives a short overview of the menu items, which can also be found in the **More** menu.

Autolnc FiberID	To activate automatic incrementation.
Autolnc Prefix	To set the prefix of the results in automatic incrementation.
Autolnc Index	To define the starting point of numeric automatic incrementation.
Create Project	To create a new project group.
Delete Project	To delete the project currently displayed.
Delete Selected	To delete the selected data sets.
Deselect All	To reset the selection.
Info	To show information how to setup Link Data Mode.
Link Data Mode	To summarize data for a project.
Onboard Manual	To show reference information and user assistance for the instrument.
Reports	To generate one report from the measurement results.
Select All	To select all the data sets of the displayed group.
Select Group	To select a group.
Shown Columns	To show or hide the available columns of a data set.
Sort Order	To sort the data sets alphabetically or chronologically.
View Selected	To view the images of an inspection measurement.


Selecting the group to save or display results

To relocate results and images, these can be stored in different groups.

The results and images are stored in the group most recently selected.

To select another group:


✓ The instrument is in the **Data & Reports** view.

1. Press the  key.
2. Tap the **[Select Group]** button.
3. Select a group.

Selected group is displayed.

Tip: Depending on the active application, the **Data & Reports** can be distinguished by the **Timestamp** or a five-digit sequential number.


Saving results

Results are stored simply by pressing the  key. Each time the key is pressed, the results will be stored.

Notes: If the OLP-87P with integrated patch cord microscope is connected to a Digital Probe, the images for the PCM and the Digital Probe will be stored in different folders.

To save current results successively:

✓ The instrument is in application mode.

1. Press the  key.

The Fiber ID edit menu is displayed:

BAKER.STREET.10

7	8	9	ABC
4	5	6	-
1	2	3	.
0	<	>	OK
Fiber ID			

2. Type in the **Fiber ID**.

3. Tap the **[OK]** button.

The measurement is stored.

4. Press the [H] key again every time you want to save an additional result value.

The display briefly shows the Fiber ID used.

Notes: If the **Fiber ID** is not changed, the data set will be saved under the same title. Depending on the active application, the **Data & Reports** can be distinguished by the **Timestamp** or a five-digit sequential number. The **Fiber ID** can be sorted using the timestamp.

Displaying stored results

To display the last results stored:

- ✓ The homescreen is displayed.

1. Press the [≡] key.

2. Tap the [Data & Reports] button.

A selection of the available applications is displayed.

3. Tap the desired application button.

– or –



- ✓ The instrument is in application mode.

1. Press the [≡] key.

2. Tap the [More] button.

3. Tap the [Data & Reports] button.

The measurement data of the currently selected group is displayed:

Group: default		14:41		
✓	Fiber ID	λ [nm]	Pow [dBm]	
✓	BAKER.STREET.10	1310	LOW	
✓	BAKER.STREET.10	1490	LOW	
✓	BAKER.STREET.10	1550	LOW	
	FIBERID12	1310	LOW	

To display the last results stored in Probe mode:

- ✓ The homescreen is displayed.

1. Tap the [Data & Reports] button.

2. Tap the [Probe] button.

Measurement data of the currently selected group is displayed.

3. Select the measurements you would like to view with the up or down arrow key and press the center key within the arrow keys to set a checkmark.
– or –
To set a checkmark, tap on the desired measurements.
4. Press the [≡] key and tap the [View Selected] button to view the selected measurements.
5. Navigate through the selected measurements with the left or right arrow key.
6. Press the [↶] key if you wish to go back to the previous screen.

Generating a report

✓ The **Data & Reports** menu is displayed.

1. Press the [≡] key.
2. Tap the [More] button.
3. To generate a report from the measurement results, tap the [Reports] button.

Notes: For a project, only one report be created.

Summarize data by using the Link Data Mode

Several measuring points can be summarized in one project. A measuring point can contain several measurement results. The measurement results may consist of several application results.

To create a project:

✓ The **Data & Reports** menu is displayed.

1. Press the [≡] key.
2. Tap the [More] button.
3. Tap the [Create Project] button.
4. Type in the **Project Name**.
5. Tap the [OK] button.

The project is created.

To select a project:

✓ The **Data & Reports** menu is displayed.

1. Press the [≡] key.
2. Tap the [More] button.
3. Tap the [Select Project] button.

4. Select the project you want to link.

To link measurement data to a project:

✓ The **Data & Reports** menu is displayed.

✓ The desired project is selected.

1. Press the [≡] key.

2. Tap the [More] button.

3. Tap the [Link Data Mode] button.

Project settings are shown grayed. Link Data Mode is active.

4. Press the [↶] key to exit from the menu.

To changed the linked applications:

✓ The homescreen is displayed.

1. Press the [≡] key.

2. Tap the [Settings] button.

3. Tap the [Linked Applications] button.

4. Tap the [Link Data Mode] button.

5. Tap the [Linked Applications] button.

6. Select the applications you want to link.

7. Press the [↶] key to exit from the menu.

Clearing the memory

Each data set contains the wavelength, the relative power level and reference value or the absolute power level, the threshold set, and the date/time when it was stored.

You do not have to clear the entire memory to free up capacity. You can clear individual data or group locations.

The OLS-85 has the following memory clear functions:

- **Delete Selected**
Clears the data of the selected measurement
- **Delete Project**
Clears all the measurements of the selected project

Clearing memory data

✓ The **Data & Reports** menu is displayed.

► Press the [≡] key.

To clear the data from a current measurement:

1. Select the group and measurement you want to clear.
2. Tap the [Delete Selected] button.
3. Press the [↩] key to exit from the menu.

Notes: Now if you save results, they will be stored at the memory location of the last group displayed.

To clear all the data of a project:

1. Select the project you want to clear.
2. Tap the [More] button.
3. Tap the [Delete Project] button.
4. Press the [↩] key to exit from the menu.

Notes: Now if you save results, they will be stored at the memory location of the last group displayed.

8 MAINTENANCE



⚠ WARNING

Dangerous voltage and invisible laser radiation

Maintenance or cleaning of the instrument while it is connected or operating may damage the instrument or injure you.

- ▶ Make sure that the instrument is switched off and disconnected from all power sources and optical radiation sources before maintenance or cleaning.

Cleaning the test port

It is a good idea to check that the optical connections are clean and clean them if necessary before starting measurements. Even very small dust particles on the end surfaces of the plugs or in the test adapters can adversely affect the accuracy of the measurement.

1. Switch off the instrument.
2. Remove the test adapter from the optical connection.
The surface of the photodiode is now accessible.
3. Using as little pressure as possible, gently wipe the surface of the photodiode using a cotton bud soaked in isopropanol.
The surface of the photodiode is clean and does not leave residue.
4. Blow out the test adapter with clean compressed air (available in spray cans, e.g. anti-dust spray).

Notes: Cover the optical connections with the dust cap whenever they are not in use. This prevents them from getting dirty.

Cleaning the instrument

If the instrument gets dirty through use, you can clean it using a soft cloth moistened with a mild solution of detergent.

NOTICE

Water and cleaning fluids

The instrument may be damaged or destroyed if water or cleaning fluids penetrate it.

- Make sure that water or cleaning fluids do not penetrate the instrument.
-

9 REMOTE CONTROL

Communication interface

The OLS-85 is equipped with a USB 2.0 (Micro-B) device interface for remote control via a PC. In order to operate the OLS-85 via remote control it has to be connected to a PC with a USB cable (see “Accessories” on page 89).



Fig. 9.1 USB cable for connection to a PC

The required driver files for the PC can be downloaded from <http://scf.updatemyunit.net>. See the Readme file provided with the driver package for installation guidance.

General operation

The main purpose of the remote control capability of the SmartClass™ Fiber family is to set and get Setup and Result values from an application. More complex remote control commands (called Extended Commands) providing extended application functionality are also available.

In general SmartClass™ Fiber allows multiple applications running on the system simultaneously. Hence there must be a way to select an application to which the remote control commands should be directed. Refer to “[Selecting an application](#)” on page 56 for more information.

In addition to the application-specific commands, there is a set of Generic Commands which control the instrument itself, independent from the currently selected application.

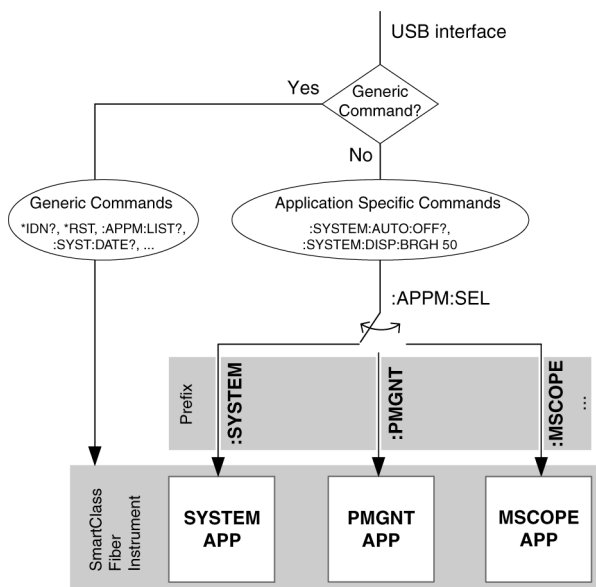


Fig. 9.2 Remote control block diagram

Selecting an application

In order to get to all available applications, to change the currently selected application, and to get to the currently selected application there is a set of application management commands. The application management commands are a subset of the Generic Commands and start with :APPM. The application management acts as a switch routing the remote control commands to the selected application. In order to identify an application each application has a unique application ID (<app_ID>) which will be used to set the switch.

For example send :APPM:SEL SYSTEM in order to select the system application.

In addition to selection via the application management commands, one can use a colon followed by the <app_ID> as a prefix to the remote command.

For example, add the prefix :SYSTEM to any system application command in order to communicate with the system application.

Notes: Adding a prefix to a command has the same effect as selecting an application via an application management command. Hence, after using a prefix, the application corresponding to that prefix is the selected application.

Getting access to shared resources

On some instruments multiple applications share the same hardware resources. For that reason SmartClass™ Fiber instruments have the simple paradigm: the application which is visible on the GUI always has access to the shared resources. Regarding remote control, an application may not provide full functionality if it is not the currently visible application. In order to make sure the remote controlled application has full functionality, one should make the application visible by using the commands in the following table.

Command	Purpose
:APPM:LIST?	Provides a list of all application IDs separated by commas
:SYSTEM:APP:ID: VSBL <app_ID>	Makes the application corresponding to the application ID visible
:SYSTEM:APP:ID: VSBL?	Retrieves the ID of the currently visible application

Notes: Applications that are not currently visible will return -221, “Settings conflict” when setting a Setup that affects shared resources, Results will return an invalid value 9.91E37 (NAN), and most of the Extended Remote Commands will return -100, “Command error”.

Query the numerical setting range in the setup

The suffixes :MINV and :MAXV return the minimal and maximal allowed values:

e.g. :SYSTEM:DISP:BRGH:MINV? returns the value 10 and
:SYSTEM:DISP:BRGH:MAXV? the value 100.

Command parameters and responses

The following table lists the parameter and response types used for remote control.

<NR1>	Integer value. Examples: 23, 90, 0
<NR2>	Real number. Examples: 23.45, 1.30
<NR3>	Exponential number. Examples: 4.3E-3, -8.9456E8, 123E-5
<NRf>	<NR1> <NR2> <NR3>
<BOOLEAN>	Boolean value. If the setting range is used as a response type, 0 and 1 are returned. Examples: 0, OFF, FALSE 1, ON, TRUE
<NAN>	Not a number. Indicates an invalid result. The returned value is 9.91E37.
<STRING>	IEEE488.2
<STRING_RESPONSE_DATA>	IEEE488.2

Commands

Overview

Generic commands

These commands are always used without a prefix.

*IDN?
*OPT?
*RST
:APPM:LIST?
:APPM:SEL
:APPM:SEL?
:APPM:VER?
:SYST:DATE
:SYST:DATE?
:SYST:ERR?
:SYST:TIME
:SYST:TIME?

Probe application/PCM application

These commands are used with the prefix :MSCOPE (for Probe application, external microscope) or with the prefix :PCM (for PCM application, built-in microscope).

Results

```
:FQM:PERC?
:FQM:PERC:MAX?
:INSP:PASS?
:INSP:PASS:ZONE:A? ... F?
:INSP:ZONE:NUMB?
```

Setups

```
:APP:ID:VSBL
:APP:ID:VSBL?
:AUTO:CNTR
:AUTO:CNTR?
:CAPT:BTTN:MODE
:CAPT:BTTN:MODE?
:FQM:ENAB
:FQM:ENAB?
:FRZE:BUSY?
:INSP:BUSY?
:INSP:ERR?
:INSP:PRF:NAME
:INSP:PRF:NAME?
:INSP:PRF:NAMES?
:INSP:TBL:SHOW
:INSP:TBL:SHOW?
:INSP:TIP:NAME
:INSP:TIP:NAME?
:INSP:TIP:NAMES?
:MAGN:HIG
:MAGN:HIG?
:MICR:BAD?
:MICR:CON?
:MICR:DET?
:MICR:OPER:MODE
:MICR:OPER:MODE?
:OVRL:SHOW
:OVRL:SHOW?
:STOR:AUTO:INCR:ENAB
:STOR:AUTO:INCR:ENAB?
:STOR:AUTO:INCR:IDX
:STOR:AUTO:INCR:IDX?
```



```
:STOR:AUTO:INCR:PRFX
:STOR:AUTO:INCR:PRFX?
:STOR:AVLB?
:STOR:GRP:NAME
:STOR:GRP:NAME?
:STOR:GRP:NAMES?
:STOR:NAMES?
:STOR:NOTE
:STOR:NOTE?
:STOR:WR:BUSY?
```

Extended commands

```
:APP:FACT:DEF
:MICR:CAL:INFO?
:MICR:MODL:NAME?
:MICR:SER:NUMB?
:MICR:SW:VER?
:STOR:ALL:DEL
:STOR:DEL
:STOR:GRP:CREA
:STOR:GRP:DEL
:STOR:EVAL:TYPE?
:STOR:RD?
:STOR:RD:EVAL:XML?
:STOR:RD:FMAP?
:STOR:RD:IMG:HIG?
:STOR:RD:IMG:HIG:OVRL?
:STOR:RD:IMG:LOW?
:STOR:RD:IMG:LOW:OVRL?
:STOR:WR
```

Laser application

These commands are used with the prefix :LASER.

Setups

```
:APP:ID:VSBL
:APP:ID:VSBL?
:AUTO:LMBD
:AUTO:LMBD?
:AUTO:LMBD:MODE
:AUTO:LMBD:MODE?
:MEAS:ACT?
:SER:MODE:ACT:WLEN
:SOUR:ENAB:AVLB:WLEN?
:SOUR:ENAB:LSR
:SOUR:ENAB:LSR?
:SOUR:ENAB:WLEN
:SOUR:ENAB:WLEN?
:SOUR:ENAB:WLEN:NUMB
:SOUR:OUTP:WLEN?
:SOUR:POW:WLEN1 ... 4
:SOUR:POW:WLEN1 ... 4?
:SOUR:TONE
:SOUR:TONE?
:SOUR:WLEN:NUMB?
:SOUR:WLEN?
:STOR:AVLB
:STOR:GRP:NAME
:STOR:GRP:NAME?
:STOR:GRP:NAMES
:STOR:NAMES?
:STOR:NOTE
:STOR:NOTE?
```

SYSTEM application

These commands are used with the prefix :SYSTEM.

Setups

:APP:ID:VSBL
:APP:ID:VSBL?
:AUTO:OFF
:AUTO:OFF?
:DISP:BRGH
:DISP:BRGH?
:DISP:OFF
:DISP:OFF?
:ETH:MAC:ADDR?
:IP:ADDR?
:IP:ADDR:STAT
:IP:ADDR:STAT?
:IP:GATE
:IP:GATE:STAT
:IP:GATE:STAT?
:IP:MASK
:IP:MASK:STAT
:IP:MASK:STAT?
:IP:MODE
:IP:MODE?
:LANG
:LANG?
:OPT:INST:BUSY?
:OPT:INST:ERR:LIST?
:OPT:INST:LIST?
:OPT:ULCK?
:STOR:AVLB?

Extended commands

:APP:FACT:DEF

PowerManagement application

These commands are used with the prefix :PMGNT.

Results

:BATT:CAP:PERC?

:BATT:TYPE?

:POW:SPLY:CON?

Setups

:STOR:AVLB?

Extended commands

:APP:FACT:DEF

Detailed description of the commands

Generic commands

Command string	Parameter type / Response type / Unit / Info
*IDN?	Returns the unique identification of the instrument. Response type: <STRING_RESPONSE_DATA> e.g. JDSU Germany GmbH, OLS-85/01,A-0106,V03.30
*OPT?	Returns the installed software options.
*RST	Sets the parameters of all running applications to their default values. Calls :APP:FACT:DEF of all applications.
:APPM:LIST?	Provides a list of application IDs separated by commas. Response type: <STRING_RESPONSE_DATA>
:APPM:SEL <STRING>	Selects the application specified by the application ID provided. Valid values: All application IDs returned from :APPM:LIST?
:APPM:SEL?	Returns the application ID of the currently selected application.
:APPM:VER?	Returns the version of the remote control application.
:SYST :DATE	Sets the system date (yyyy,mm,dd). e.g. :SYST:DATE 2013,03,30
:SYST :DATE?	Returns the system date (yyyy,mm,dd). e.g. 2013,03,30
:SYST:ERR?	Returns content of error queue.
:SYST :TIME	Sets the system time (hh,mm,ss). e.g. :SYST:TIME 23,59,59
:SYST :TIME?	Returns the system time (hh,mm,ss). e.g. 23,59,59

Results for the Probe application/PCM application

Command string	Parameter type / Response type / Unit / Info
:FQM :PERC?	Focus quality result. 0 = Not calculated for the image. Response type: <NR1>
:FQM:PERC :MAX?	Focus quality highwater mark. Highest focus quality value recently observed. Response type: <NR1>
:INSP:PASS?	Pass/Fail result for the complete fiber. Response type: <BOOLEAN>
:INSP:PASS :ZONE:A? ... F?	Pass/Fail result for fiber zones A–F respectively, depending on the selection. Response type: <BOOLEAN>
:INSP:ZONE :NUMB?	Number of available inspection zones. Response type: <NR1>

Setups for the Probe application/PCM application

Command string	Parameter type / Response type / Unit / Info
:APP:ID :VSBL <STRING>	<p>Makes the specified application visible (i.e. brings the specified application to foreground).</p> <p>Notes: Full functionality is only available for the active application, so it may be important to know which application is active.</p> <p>Valid values: All application IDs returned by :APPM:LIST?.</p>
:APP:ID :VSBL?	<p>Returns the name of measurement application which is currently visible on the display.</p> <p>Response type: <STRING> See :APP:ID:VSBL command for more information.</p>
:AUTO:CNTR <BOOLEAN>	<p>Controls fiber center tracking for live video images in high-magnification mode.</p> <p>Default: TRUE</p>
:AUTO:CNTR?	<p>Returns TRUE if the fiber center tracking in live video is turned on.</p> <p>Response type: <BOOLEAN> See :AUTO:CNTR command for more information.</p>
:CAPT:BTNN :MODE <NR1>	<p>Controls the function of the probes capture button.</p> <p>Valid values: 0: Freeze 1: Test</p> <p>Default: 1</p>
:CAPT:BTNN :MODE?	<p>Returns which function the probes capture button has.</p> <p>Response type: <NR1> See :CAPT:BTNN:MODE command for more information.</p>

Command string	Parameter type / Response type / Unit / Info
:FQM:ENAB <BOOLEAN>	The Digital Probe calculates a focus quality metric for each video frame. If this flag is set to TRUE, the result is displayed as a focus bar on the screen. Deactivating this calculation can speed up video frame rate in some cases. Default: TRUE
:FQM:ENAB?	Returns TRUE if the calculated focus quality metric for video frames is enabled. Response type: <BOOLEAN> See :FQM:ENAB command for more information.
:FRZE:BUSY?	Returns TRUE if an image is captured. After saving the image, the value is changed to FALSE. Response type: <BOOLEAN>
:INSP:BUSY?	Returns TRUE if the analysis of an image has been started. After analyzing the image, the value is changed to FALSE. Response type: <BOOLEAN>
:INSP:ERR?	Returns TRUE if the test of an image causes an error. Response type: <BOOLEAN>
:INSP:PRF :NAME <STRING>	Name of the selected inspection profile name. The first entry in the common profile names directory is used as default name. See :INSP:PRF:NAMES? command for more information.
:INSP:PRF :NAME?	Returns the name of the selected inspection profile. Response type: <STRING> See :INSP:PRF:NAME command for more information.
:INSP:PRF :NAMES?	Returns the names of all available inspection profiles (read from common (PCM and MSCOPE) profile directory).
:INSP:TBL :SHOW <BOOLEAN>	Shows or hides the result table for a tested image. Default: TRUE
:INSP:TBL :SHOW?	Returns TRUE if the result table for a tested image is displayed. See :INSP:TBL:SHOW command for more information.

Command string	Parameter type / Response type / Unit / Info
:INSP:TIP :NAME <STRING>	Selects one tip out of the tip names map. See :INSP:TIP:NAMES? command for more information. Each time the tip names map changes, the tip name has to be updated.
:INSP:TIP :NAME?	Returns the name of the selected tip. Response type: <STRING> See :INSP:TIP:NAME command for more information.
:INSP:TIP :NAMES?	Returns the names of all available tips that match both of the following conditions: <ul style="list-style-type: none"> • The tip name and the name of an active calibration of the connected Digital Probe must be identical. See :MICR:CAL:INFO? command for more information. • At least one entry in the INSP:PRF:NAMES list must support this kind of tip. Each time the active profile is changed, this map will be updated.
:MAGN:HIGH <BOOLEAN>	Sets the magnification of the Digital Probe. Default: FALSE
:MAGN:HIGH?	Returns TRUE if the magnification of the Digital Probe is high. Response type: <BOOLEAN> See :MAGN:HIGH command for more information.
:MICR:BAD	Returns TRUE if the detected Digital Probe could not be initialized properly. Response type: <BOOLEAN>
:MICR:CON	Returns TRUE if a Digital Probe is detected and the authorization as well as initialization tasks have finished successfully. Response type: <BOOLEAN>
:MICR:DET	Returns TRUE if a Digital Probe is detected. Response type: <BOOLEAN>

Command string	Parameter type / Response type / Unit / Info
:MICR:OPER :MODE <NR1>	<p>Selects the operation mode of the Digital Probe.</p> <p>Valid values: 0 (Live image) 2 (Snapshot) 3 (Test)</p> <p>Default: 0</p>
:MICR:OPER :MODE?	<p>Returns the actual operation mode of the Digital Probe.</p> <p>Response type: <NR1> See :MICR:OPER:MODE command for more information.</p>
:OVL:SHOW <BOOLEAN>	<p>Displays or hides the overlay for a tested image.</p> <p>Default: TRUE</p>
:OVL:SHOW?	<p>Returns TRUE if the overlay for a tested image is displayed.</p> <p>Response type: <BOOLEAN> See :OVL:SHOW command for more information.</p>
:STOR:AUTO :INCR:ENAB <BOOLEAN>	<p>Enables the automatic increment feature.</p> <p>Default: TRUE</p>
:STOR:AUTO :INCR:ENAB?	<p>Returns TRUE if the automatic increment feature is enabled.</p> <p>Response type: <BOOLEAN> See :STOR:AUTO:INCR:ENAB command for more information.</p>
:STOR:AUTO :INCR:IDX <NR1>	<p>Sets the start index for the automatic increment feature.</p> <p>Valid range: 1 to maximum integer</p> <p>Default: 1</p>
:STOR:AUTO :INCR:IDX?	<p>Returns the current index for the automatic increment feature.</p> <p>Response type: <NR1> See :STOR:AUTO:INCR:IDX command for more information.</p>

Command string	Parameter type / Response type / Unit / Info
:STOR:AUTO :INCR:PRFX <STRING>	Sets the prefix for the automatic increment feature.
:STOR:AUTO :INCR:PRFX?	Returns the prefix for the automatic increment feature. Response type: <STRING> See :STOR:AUTO:INCR:PRFX command for more information.
:STOR :AVLB?	Returns whether the application can or cannot store measurements.
:STOR:GRP :NAME <STRING>	Sets the selected storage group name.
:STOR:GRP :NAME?	Returns the name of the currently selected storage group. Response Type: <STRING> See :STOR:GRP:NAME command for more information.
:STOR:GRP :NAMES?	This setup contains the names of all available storage groups. The “default” group is always available.
:STOR :NAMES?	This setup contains the fiber IDs and internal IDs belonging to the group specified by :STOR:GRP:NAME.
:STOR:NOTE <STRING>	A user specific note which is stored with the measurement results.
:STOR :NOTE?	Returns the stored user note. Response Type: <STRING> See :STOR:NOTE command for more information.
:STOR:WR :BUSY?	Returns TRUE if a storage command is active. After saving the measurement the value FALSE will be returned. Response type: <BOOLEAN>

Extended commands for the Probe application/PCM application

Command string	Parameter type / Response type / Unit / Info
:APP:FACT:DEF	Sets all parameters of the application to their default values.
:MICR:CAL:INFO?	Returns the list of calibrations ("tips") of the connected Digital Probe. Example of a list: (sf = supported fibers) PCM: 2 active calibrations: [0], "Standard Tips (with BAP1)", sf=1;[1], "Ribbon Tips", sf=2
:MICR:MODL :NAME?	Returns the model of the connected Digital Probe. Usually: "FBP-P5000i"
:MICR:SER :NUMB?	Returns the serial number of the connected Digital Probe. For example "0x699C002".
:MICR:SW:VER?	Returns the firmware version of the connected Digital Probe. For example "1.2.41.903".
:STOR:ALL:DEL	Deletes all measurement entries and groups. Creates a new empty "default" group. :STOR:GRP:NAME is set to default.
:STOR:DEL <STRING>, <STRING>, <STRING>	Deletes a dedicated measurement result specified by group (string1), fiber identifier (string2) and internal identifier (string3).
:STOR:EVAL :TYPE? <STRING>, <STRING>, <STRING>	Returns "1" if a dedicated measurement result specified by group (string1), fiber identifier (string2), and internal identifier (string3) contains a Pass/Fail analysis. Otherwise it returns "0".
:STOR:GRP :CREA <STRING>	Creates an empty storage group. For example :PCM:STOR:GRP:CREA myGroupName
:STOR:GRP :DEL <STRING>	Deletes the storage group specified by string. For example :PCM:STOR:GRP:CREA default2. After deleting the currently selected group (see :STOR:GRP:NAME), the selection will be changed to "default" group. Any attempt to delete the "default" group will only delete the contents of this group.

Command string	Parameter type / Response type / Unit / Info
:STOR:RD? <STRING>, <STRING>, <STRING>	Returns a string describing the measurement result specified by group (string1), fiber identifier (string2), and internal identifier (string3).
:STOR:RD:EVAL :XML? <STRING>, <STRING>, <STRING>	Returns the contents of a *.pfr.xml (“pfr” = “pass/fail result”) file specified by group (string1), fiber identifier (string2), and internal identifier (string3). Special format: “#h:3104,696e7072cdcc”
:STOR:RD:FMAP? <STRING>, <STRING>, <STRING>	Returns the contents of a *.fmap.pgm.gz (“fmap.pgm.gz” = “feature map.portable gray map.zip”) file specified by group (string1), fiber identifier (string2), and internal identifier (string3). Special format: “#h:3104,696e7072cdcc”
:STOR:RD :IMG:HIGH? <STRING>, <STRING>, <STRING>	Returns the contents of a *.hm.jpg (“hm.jpg” = “high magnification.jpg”) file specified by group (string1), fiber identifier (string2), and internal identifier (string3). Special format: “#h:10091,696e7072cdcc”
:STOR:RD:IMG :HIGH:OVRL? <STRING>, <STRING>, <STRING>	Returns the contents of a *.thm.jpg (“thm.jpg” = “test high magnification.jpg”) file specified by group (string1), fiber identifier (string2), and internal identifier (string3). Special format: “#h:16100,696e7072cdcc”

Command string	Parameter type / Response type / Unit / Info
:STOR:RD :IMG:LOW? <STRING>, <STRING>, <STRING>	Returns the contents of a *.lm.jpg ("lm.jpg" = "low magnification.jpg") file specified by group (string1), fiber identifier (string2), and internal identifier (string3). Special format: "#h:14823,696e7072cdcc"
:STOR:RD:IMG :LOW:OVRL? <STRING>, <STRING>, <STRING>	Returns the contents of a *.t1m.jpg ("t1m.jpg" = "test low magnification.jpg") file specified by group (string1), fiber identifier (string2), and internal identifier (string3). Special format: "#h:16100,696e7072cdcc"
:STOR:WR <STRING>, <STRING>	Writes a dedicated measurement result specified by group (string1) and fiber identifier (string2). If the given group doesn't exist, it will be created. This command creates up to seven files for up to seven components of the result. The seven ":STOR:RD..." queries are used to read these result files. To create unique file names, this function automatically adds an internal index.

Setups for the Laser application

Command string	Parameter type / Response type / Unit / Info
:APP:ID :VSBL <STRING>	Makes the specified application visible (i.e. brings the specified application to foreground). Notes: Full functionality is only available for the active application, so it may be important to know which application is active. Valid values: All application IDs returned by :APPM:LIST?.
:APP:ID :VSBL?	Displays the name of measurement application which is currently visible on the display. Response type: <STRING> See :APP:ID:VSBL command for more information.
:AUTO:LMBD <BOOLEAN>	Determines whether the instrument recognizes Auto λ modulation frequencies. Default: TRUE

Command string	Parameter type / Response type / Unit / Info
:AUTO :LMBD?	Returns TRUE if the instrument recognizes Auto λ modulation frequencies. Response type: <BOOLEAN> See :AUTO:LMBD for more information.
:AUTO:LMBD :MODE	Setup to start auto lambda mode. If the Auto λ isn't already active, it will be activated by starting the setup. 0: Serial 1: Multi Default: 1
:AUTO:LMBD :MODE?	Returns which auto lambda mode is active. See :AUTO:LMBD:MODE for more information.
:MEAS:ACT?	Shows the status of the measurement. Valid results are available if this setup is TRUE. Response type: <BOOLEAN>
:SER:MODE :ACT:WLEN <NR1>	Returns the wavelength of the active laser source, if the auto lambda mode is active. Valid range: 800 to 1700 Default: 0
:SOUR:ENAB :AVLB:WLEN?	Returns an array of boolean values indicating if a laser with a particular wavelength can be enabled. E.g. the value "TRUE, TRUE, FALSE, FALSE" means lasers at positions 0 and 1 can be enabled, and lasers at positions 2 and 3 cannot be enabled.
:SOUR:ENAB :LSR	To activate or deactivate the output for all selected laser sources.
:SOUR:ENAB :LSR?	Returns FALSE if all lasers are deactivated. Response type: <BOOLEAN> See :SOUR:ENAB:LSR for more information.

Command string	Parameter type / Response type / Unit / Info
:SOUR:ENAB :WLEN	<p>Selects or deselects the laser sources which will be turned on when :SOUR:ENAB:LSR is set to TRUE. See :SOUR:ENAB:LSR for more information.</p> <hr/> <p>To change a selection in the array, enter the addition :DATA, the index position followed by a comma and the corresponding boolean value. E.g. in order to select laser at index position 1 send :SOUR:ENAB:WLEN:DATA 1,TRUE</p>
:SOUR:ENAB :WLEN?	<p>Returns the selection state for all available laser sources. See :SOUR:ENAB:WLEN for more information.</p>
:SOUR:ENAB :WLEN:NUMB?	<p>Returns the number of the selected laser sources. Response Type: <NR1></p>
:SOUR:OUTP :WLEN?	<p>Returns the optical port/connector for each laser.</p>
:SOUR:POW :WLEN1 ... 4	<p>Selects output power for all laser sources (unit dBm). The application is capable of handling 4 laser sources. Some instruments may provide less than 4 laser sources.</p>
:SOUR:POW :WLEN1 ... 4?	<p>Returns the output power in dBm. See :SOUR:POW:WLEN1 ... 4 for more information.</p>
:SOUR:TONE <NR1>	<p>Sets the modulation frequency.</p> <p>Notes: The selected value is written to the laser sources if Auto λ is disabled.</p> <p>Valid values: 0: CW 1: 270 Hz 2: 1 kHz 3: 2 kHz</p> <p>Default: 0</p>
:SOUR:TONE?	<p>Returns the currently selected modulation frequency.</p>
:SOUR:WLEN :NUMB?	<p>Returns the number of available laser sources. The application is capable of handling 4 laser sources. Some instruments may provide less than 4 laser sources.</p> <p>Response Type: <NR1></p>

Command string	Parameter type / Response type / Unit / Info
:SOUR:WLEN?	Returns the wavelengths of all lasers sources.
:STOR :AVLB?	Returns whether the application can or cannot store measurements. Always TRUE for PowerMeter application.
:STOR:GRP :NAME <STRING>	Sets the selected storage group name.
:STOR:GRP :NAME?	Returns the name of the currently selected storage group. Response Type: <STRING> See :STOR:GPR:NAME command for more information.
:STOR:GRP :NAMES?	This setup contains the names of all available storage groups. The “default” group is always available.
:STOR :NAMES?	This setup contains the fiber IDs and internal IDs belonging to the group specified by :STOR:GRP:NAME.
:STOR:NOTE <STRING>	A user specific note which is stored with the measurement results.
:STOR :NOTE?	Returns the stored user note. Response Type: <STRING> See :STOR:NOTE command for more information.

Setups for the SYSTEM application

Command string	Parameter type / Response type / Unit / Info
:APP:ID :VSBL <STRING>	<p>Makes the specified application visible (i.e. brings the specified application to foreground).</p> <p>Notes: Full functionality is only available for the active application, so it may be important to know which application is active.</p> <p>Valid values: All application IDs returned by :APPM:LIST?.</p>
:APP:ID :VSBL?	<p>Returns the application ID of the currently visible application.</p> <p>Response type: <STRING> See :APP:ID:VSBL command for more information.</p>
:AUTO:OFF <NR1>	<p>Sets the time of inactivity after which the instrument automatically goes into standby mode. If an external power supply is connected, the instrument doesn't enter standby mode.</p> <p>Valid values: 0 (5 min) 1 (10 min) 2 (20 min) 3 (30 min) 4 (Never)</p> <p>Default: 2</p>
:AUTO:OFF?	<p>Returns the time of inactivity after which the instrument automatically goes into standby mode.</p> <p>Response type: <NR1> See :AUTO:OFF command for more information.</p>
:DISP:BRGH <NR1>	<p>Sets the brightness of the display in percent.</p> <p>Valid range: 10 to 100</p> <p>Default: 50</p>

Command string	Parameter type / Response type / Unit / Info
:DISP :BRGH?	Returns the brightness of the display in percent. Response type: <NR1> See :DISP:BRGH command for more information.
:DISP:OFF <NR1>	In order to save power, the display switches off automatically after a predefined time of inactivity. If an external power supply is connected, the display doesn't switch off. Valid values: 0 (15 sec) 1 (30 sec) 2 (1 min) 3 (2 min) 4 (10 min) 5 (Never) Default: 5
:DISP:OFF?	Returns the time of inactivity after which the display automatically switches off. Response type: <NR1> See :DISP:OFF command for more information.
:ETH:MAC :ADDR?	Returns the actual MAC address of the instrument.
:IP:ADDR?	Returns the IP address which is currently valid for the instrument. In static mode, this setup corresponds to IP:ADDR:STAT; in DHCP mode, it is provided by the DHCP server. This setup is read-only.
:IP:ADDR :STAT <STRING>	Sets the static mode IP address.
:IP:ADDR :STAT?	Returns the static mode IP address. Response type: <STRING> See :IP:ADDR:STAT command for more information.

Command string	Parameter type / Response type / Unit / Info
:IP:GATE?	Returns the IP gateway address which is currently valid for the instrument. In static mode, this setup corresponds to IP:GATE:STAT; in DHCP mode, it is delivered by the DHCP server. This setup is read-only.
:IP:GATE :STAT <STRING>	Sets the static mode gateway address.
:IP:GATE :STAT?	Returns the static mode gateway address. Response type: <STRING> See :IP:GATE:STAT command for more information.
:IP:MASK?	Returns the IP mask which is currently valid for the instrument. In static mode, this setup corresponds to IP:MASK:STAT; in DHCP mode, it is provided by the DHCP server. This setup is read-only.
:IP:MASK :STAT <STRING>	Sets the static mode IP mask.
:IP:MASK :STAT?	Returns the static mode IP mask. Response type: <STRING> See :IP:MASK:STAT command for more information.
:IP:MODE <NR1>	Selects if the IP address should be requested by DHCP or a static address should be used. Valid values: 0 (STATIC) 1 (DHCP) Default: 1
:IP:MODE?	Returns whether the instrument is set to a static or dynamic IP address. Response type: <NR1> See :IP:MODE command for more information.

Command string	Parameter type / Response type / Unit / Info
:LANG <NR1>	Sets the user interface language. Valid values: 0 (en_US) 1 (de_DE) 2 (fr_FR) 3 (es_ES) 4 (zh_CN) 5 (zh_TW) Default: 0
:LANG?	Returns which user interface language is set. Response type: <NR1> See :LANG command for more information.
:OPT:INST :BUSY?	Returns TRUE if an installation is in progress. Response type: <BOOLEAN>
:OPT:INST :ERR:LIST?	Returns a list of errors that occurred during installation of a license via USB flash drive or a key. List is cleared at the beginning of each installation.
:OPT:INST :LIST?	Returns a list of the software options installed via USB flash drive or a key. The list is cleared at the beginning of each installation.
:OPT:ULCK?	Returns all installed software options.
:STOR :AVLB?	Returns whether the application can or cannot store measurements. Always FALSE for SYSTEM application.

Extended commands for the SYSTEM application

Command string	Parameter type / Response type / Unit / Info
:APP:FACT :DEF	Sets all parameters of the application to their default values.

Results for the PowerManagement application

Command string	Parameter type / Response type / Unit / Info
:BATT:CAP :PERC?	Returns the remaining battery capacity in percent. If :BATT:TYPE == NOBATT 0 is returned.
:BATT :TYPE?	The instrument can work without an internal battery (NOBATT), with a rechargeable Lithium Ion battery (LIION), or with standard dry-cell batteries (DRYCELL). 0: No battery 1: Lithium Ion battery 2: Dry-cell batteries
:POW:SPLY :CON?	0: No external power supply is connected. 1: An external power supply is connected.

Setups for the PowerManagement application

Command string	Parameter type / Response type / Unit / Info
:STOR :AVLB?	Returns whether the application can or cannot store measurements. Always FALSE for PowerManagement application.

Extended commands for the PowerManagement application

Command string	Parameter type / Response type / Unit / Info
:APP:FACT :DEF	Sets all parameters of the application to their default values.

Error messages

Processing the program messages can cause the following error messages:

- 0, "No error"
- -310, "System error"
- -350, "Queue overflow"
- -360, "Communication error"
- -100, "Command error"
- -101, "Invalid character"
- -108, "Parameter not allowed"
- -109, "Missing parameter"
- -110, "Command header error"
- -112, "Program mnemonic too long"
- -113, "Undefined header"
- -220, "Parameter error"
- -221, "Settings conflict"
- -222, "Data out of range"
- -224, "Illegal parameter value"
- -254, "Media full"
- -290, "Memory use error"

10 SPECIFICATIONS

OLS-85 specifications

Laser safety	IEC 60825-1:2007
Laser classification	CLASS 1 LASER PRODUCT
Power setting resolution	0.01 dB
Tracking error	± 1 dB

Wavelengths

BN 2313/01	1310/1550 nm ¹⁾ , PC
BN 2313/05	850/1300 nm MM & 1310/1550 nm SM ¹⁾ , PC
BN 2313/06	1310/1490/1550/1625 nm ¹⁾ , PC
BN 2313/22	1310/1550/1625 nm ¹⁾ , APC
BN 2313/26	1310/1490/1550/1625 nm ¹⁾ , APC

1) Typically ± 20 nm

Wavelength accuracy

1310 nm, 1550 nm	± 20 nm
1490 nm, 1625 nm	± 3 nm
850 nm, 1300 nm	± 20 nm

Spectral width

1310 nm, 1550 nm, 1490 nm, 1625 nm	< 5 nm
850 nm ¹⁾ , IEC 61280-4-1 Encircled-Flux compliant	50 nm typ.
1300 nm ¹⁾	< 170 nm

1) LED source

Fiber types

Single-mode	9/125
Multi-mode	50/125, 62.5/125

Output power range¹

Single port instruments

2 wavelengths instruments	
Laser (CW)	-3.00 to 0.00 dBm (± 1 dB)
Laser (Modulated, Auto λ)	-6.00 to -3.00 dBm (± 1 dB)
3 & 4 wavelengths instruments	
Laser (CW)	-6.00 to -3.00 dBm (± 1 dB)
Laser (Modulated, Auto λ)	-9.00 to -6.00 dBm (± 1 dB)

Dual port instruments

SM port	
Laser (CW)	-3.00 to 0.00 dBm (± 1 dB)
Laser (Modulated, Auto λ)	-6.00 to -3.00 dBm (± 1 dB)
MM port	
LED (CW)	-23.00 to -20.00 dBm
LED (Modulated, Auto λ)	-26.00 to -23.00 dBm

Signal stability²

Short term	± 0.02 dB (within 15 min.)
Long term	± 0.20 dB (within 8 h)

Modes³

Continuous wave (CW), Modulated (270 Hz, 1 kHz, 2 kHz), Auto λ
--

¹ CW signal, T = 23 °C ± 3 K, including connector, depending on quality of connector applied to the OLS

² At ambient temperature range -10 °C to +55 °C, $\Delta T = \pm 0.3$ K

³ Signal coding for automatic power meter wavelength detection. Works only with JDSU power meters e.g. OLP-85

General specifications

Fiber inspection	Via P5000i Digital Probe with auto Pass/Fail analysis
Live image	320 x 240 pixels, 8 bit gray, 10 fps
Display	High contrast 3.5" TFT color touchscreen
Display resolution	0.01 dB / 0.001 μ W
Measurement units	dB, dBm, W
Data memory	10000 measurement results
Data readout	Via client USB interface or Ethernet
Remote control capability	Via USB
Electrical interfaces	2 USB Type A, 1 USB Micro-B, Ethernet
Power supply	Four-way power: NiMH, dry batteries, RBP2 Li-Ion Battery Pack, PS4 Universal AC/DC Power Supply 12 V
	Internal charging for RBP2 Li-Ion Battery Pack
Optical connectors	Interchangeable: SC, FC, ST, LC, DIN
	Fixed: SC
Recommended recalibration interval	3 years
Size (H x W x D)	208 x 112 x 64 mm (8.2 x 4.4 x 2.5 in)
Weight	750 g
Operating temperature range	-5 °C to +45 °C
Storage temperature range	-25 °C to +55 °C

11 ORDERING INFORMATION

OLS-85 Optical Laser Source

1310/1550 nm, PC universal adapter	BN 2313/01
1310/1550/1625 nm, APC universal adapter	BN 2313/22
1310/1490/1550/1625 nm, PC universal adapter	BN 2313/06
1310/1490/1550/1625 nm, APC universal adapter	BN 2313/26
850/1300 nm MM, 1310/1550 nm SM, PC universal adapter	BN 2313/05

Included items

Stand-alone units

- SmartClass™ Fiber instrument
- Soft shoulder case for SmartClass™ Fiber + accessories
- Electronic tool kit with Operating Manual, datasheet and Smart-Reporter SW on USB flash drive
- Two optical adapters: SC type, or selectable SC, FC, DIN, ST, LC in universal version
- Quick Start Manual and Safety Instructions
- Eight dry batteries AA size

Accessories

PS4 Universal AC/DC Power Supply for SmartClass™ Fiber	BN 2305/90.01
RBP2 Li-Ion Battery Pack for SmartClass™ Fiber	BN 2305/90.02
Calibration report	BN 2307/90.03
UC4 hands free carrier for SmartClass™ Fiber	BN 2128/01
UC4P hands free carrier for SmartClass™ Fiber with PCM	BN 2128/02
SCASE2 soft shoulder case for SmartClass™ Fiber	BN 2128/03
USB cable USB-A to Micro USB	K 807

Digital Probe

P5000i Digital Probe Microscope with FiberChekPRO software	FBP-P5000I
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JDSU Environmental Management Program

Superb performance and high quality have always characterized JDSU datacom and telecom measurement technology products. In this same world-class tradition, JDSU has an established, proactive program of environmental management.

Environmental management is an integral part of JDSU's business philosophy and strategy requiring the development of long-term, productive solutions to problems in the key areas of economics, technology, and ecology.

A systematic environmental management program at JDSU is essential in regard to environmental policy and enhances cooperation between ourselves and our business partners.

The JDSU Environmental Management Program considers:

Product design and manufacture

Environmental restrictions and requirements are taken into account during planning and manufacture of JDSU products. This attention ranges from the raw materials and finished components selected for use and the manufacturing processes employed, through to the use of energy in the factory, and right on up to the final stages in the life of a product, including dismantling.

Hazardous materials

JDSU avoids or uses with care any hazardous or dangerous material in the manufacturing process or the end product. If the use of a dangerous material cannot be avoided, it is identified in product documentation and clearly labeled on the product itself.

Packaging materials

Preference is given to reusable or biodegradable single-substance packaging materials whenever possible.

Environmental management partnerships

JDSU encourages our customers and suppliers who take this responsibility seriously to join JDSU in establishing their own environmental management programs.

Recycling used products

This product complies with the European Union Waste Electrical and Electronic Equipment directive (WEEE), 2002/96/EC. This product should not be disposed of as unsorted municipal waste and should be collected separately and disposed according to your national regulations.

In the European Union, all equipment purchased from JDSU after 2005-08-13 can be returned for disposal at the end of its useful life.

Measuring systems affected by this can be recognized by the symbol on the right of a crossed-out trash can and a black bar. This symbol can be found either on the device or in the accompanying documents.



Contact your local Technical Assistance Center (TAC) for return and collection services available to you. If you would like specific information about the JDSU Environmental Management Program, please contact us at:

If you would like specific information about the JDSU Environmental Management Program, please contact us at www.jdsu.com.

The following pages provide with respect to Chinese Requirements information with regard to the location of restricted hazardous substances within this equipment.

As measuring equipment this equipment is excluded from the European regulations for the restriction of hazardous substances (RoHS).

"中国RoHS"

《电子信息产品污染控制管理办法》（信息产业部，第39号） 附录（Additional Information required for the Chinese Market only）

本附录按照"中国RoHS"的要求说明了有关电子信息产品环保使用期限的情况，并列出了产品中含有的有毒、有害物质的种类和所在部件。本附录适用于产品主体和所有配件。

环保使用期限：



本标识标注于产品主体之上，表明该产品或其配件含有有毒、有害物质（详情见下表）。

其中的数字代表在正常操作条件下至少在产品生产日期之后数年内该产品或其配件内含有的有毒、有害物质不会变异或泄漏。该期限不适用于诸如电池等易耗品。

有关正常操作条件，请参见产品用户手册。

产品生产日期请参见产品的原始校准证书。

有毒、有害物质的类型和所在部件

元器件 (Component)	有毒、有害物质和元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR ⁶⁺)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
产品主体 (Main Product)						
印刷电路板组件 (PCB Assemblies)	X	O	O	O	O	O
内部配线 (Internal wiring)	O	O	O	O	O	O
显示器 (Display)	O	O	O	O	O	O
键盘 (Keyboard)	O	O	O	O	O	O
塑料外壳零件 (Plastic case parts)	O	O	O	O	O	O
配件 (Accessories)	O	O	O	O	O	O

O：代表该部分中所有均质材料含有的该有毒、有害物质含量低于SJ/T11363-2006标准的限值。
X：代表该部分中所有均质材料含有的该有毒、有害物质含量高于SJ/T11363-2006标准的限值。

